

**ABSTRACT**

The invention relates to a catalyst for the selective hydrodesulfurization of hydrocarbon-containing feedstocks that comprise sulfur-containing compounds and olefins. This catalyst comes in a sulfurized form and comprises a substrate that is selected from among the refractory oxides, at least one metal that is selected from the group that consists of the metals of groups VI and VIII of the periodic table and carbon, whereby the carbon content is less than or equal to 2.8% by weight. The invention also relates to a method for the production of the catalyst that is described above, as well as a process that uses this catalyst for the selective hydrodesulfurization of hydrocarbon-containing feedstocks that contain sulfur-containing compounds and olefins.